Effect Of Different Drying Processes On Antioxidant Activity Of Black Garlic

郭俊延、楊博文

E-mail: 364778@mail.dyu.edu.tw

ABSTRACT

Three different dry methods (hot air-drying, freeze-drying and spray-drying) of black garlic and untreated garlic were studied for their antioxidant effects and chemical components changes. 2,2-diphenyl-1-picryl-hydrazyl (DPPH) free radical scavenging activities and OH free radical scavenging activities were studied the effects of their different dry methods. The experimental results of scavenging DPPH radical capacity (EC50) revealed that were 1.57 mg/mL and 1.58 mg/mL in hot air-drying and spray-drying, respectively. According the results of scavenging DPPH radical capacity (EC50), hot air-drying and spray-drying were better ways to dry the black garlic. The experimental results of scavenging hydroxyl radical capacity (EC50) revealed that EC50 value of scavenging hydroxyl radical spray-drying method was 0.81 mg/mL which was the highest in three drying methods. According the total sugar analysis with phenol-sulfuric acid method, we got the highest yield 7.29% (w/v) from black garlic without drying method. The measurements of total phenolic concentration by folin-ciocalteu method revealed that the phenolic concentration could gain significant high yield 170 ± 4.0 ppm (w/v) and 133 ± 3.0 ppm (w/v) from hot air-drying and spray-drying, respectively. Without any drying method, the content of dially disulfide (DADS) in black garlic and untreated garlic are 849.39 ± 12.28 μg/g and 842.56 ± 13.29 μg /g, respectively. Both of the content of DADS in black garlic and untreated garlic will significantly decrease through drying methods. However, the amount of DADS was decreased after drying. In addition, the FTIR analyses showed no different between these two kinds of garlic after and before drying.

Keywords : Black garlic、Drying、Antioxidant、Total plyphenols、Dially disulfide

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